

What is claimed is:

1. A field emission device comprising:
a cathode on which a plurality of CNT emitters are arranged;
5 a gate insulating layer having a through hole through which electrons emitted from the CNT emitters pass; and
a gate electrode which corresponds to the through hole of the gate insulating layer and has an elongated gate hole that forms an electric field having different strengths in a first direction and in a second direction orthogonal to the first direction.

10 2. The device of claim 1, wherein the gate hole has an elongated slot shape.

15 3. The device of claim 1, wherein at least two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

4. The device of claim 2, wherein at least two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

20 5. The device of claim 3, wherein the two CNT emitters have a half-circle or crescent.

6. A field emission device comprising:
a plurality of parallel cathodes that extend in a first direction;
25 a plurality of parallel gate electrodes which extend in a second direction orthogonal to the first direction and have elongated gate holes formed where the cathodes overlap that form an electric field with difference strengths in the first and second directions;
a plurality of CNT emitters which correspond to the gate holes and are formed
30 on the cathodes; and
a gate insulating layer interposed between the cathodes and the gate electrodes.

7. The device of claim 6, wherein each of the gate holes has an elongated slot shape.

8. The device of claim 7, wherein the gate holes are elongated in the second direction.

9. The device of claim 6, wherein the two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

10. The device of claim 7, wherein the two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

11. The device of claim 8, wherein the two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

12. The device of claim 3, wherein the two CNT emitters have a half-circle or crescent.

13. The device of claim 4, wherein the two CNT emitters have a half-circle or crescent.

14. A field emission device comprising:
a plurality of parallel cathodes that extend in a first direction;
a plurality of parallel first gate electrodes which extend in a second direction orthogonal to the first direction and have a first gate holes formed where the cathodes overlap;
a first gate insulating layer in which first through holes that correspond to the first gate holes formed between the cathodes and the first gate electrodes are formed;
a second gate insulating layer in which second through holes that correspond to the first gate holes are formed; and
a second gate electrode which is formed on the second gate insulating layer and in which elongated gate holes that form an electric field having different

strengths in the first and second directions is formed.

15. The device of claim 14, wherein each of the gate holes has an elongated shape.

5 16. The device of claim 15, wherein the gate holes are elongated in the second direction.

10 17. The device of claim 14, wherein at least two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

18. The device of claim 15, wherein at least two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

15 19. The device of claim 16, wherein at least two CNT emitters are disposed side by side and correspond to one of the asymmetric gate holes.

20 20. The device of claim 17, wherein the two CNT emitters have a half-circle or crescent.

21. The device of claim 18, wherein the two CNT emitters have a half-circle or crescent.

25 22. The device of claim 19, wherein the two CNT emitters have a half-circle or crescent.